Operating instructions

Lubricating head RKC

INDEX

1. General

Prior to start up, we recommend to read these operating instructions carefully as we do not assume any liability for damages and operating troubles which result from the nonobservance of these operating instructions!
Any use beyond the applications described in these operating instructions is considered to be not in accordance with the product's intended purposes. The manufacturer is not to be held responsible for any damages resulting from this: the user alone bears the corresponding risk.
As to figures and indications in these operating instructions we reserve the right to make technical changes which might become necessary for improvements.

Company address, spare parts and service address

DELIMON
Arminstraße 15
D-40277 Düsseldorf
Phone : +49 211 77 74-0
Fax : +49 211 77 74-210

Branch office
Am Bockwald 4
D-08344 Grünhain-Beierfeld
E-mail : info@delimon.de
www.delimon.de

2. Safety

These operating instructions contain fundamental instructions which are to be observed during erection, operation and maintenance. Therefore it is absolutely necessary for the fitter and the competent qualified staff/user to read these operating instructions before installation and start-up. The operating instructions must be available at all times at the place of use of the machine/system.
Not only the general safety instructions stated under this main point "safety" are to be observed, but also the other specific safety instructions stated under the other main points.

2.1 Identification of safety warnings in the operating instructions

The safety warnings contained in these operating instructions which, if not observed, may cause dangers to people, are specially marked with general danger symbols

safety sign according to DIN 4844-W9, warning about a danger spot,

in case of warning about electric voltage with

safety sign according to DIN 4844-W8, warning about dangerous electric voltage.

In case of safety instructions which, if not observed, may cause damage to the machine and its function, the word

ATTENTION

is inserted.

Instructions that are directly attached to the machine, as for example

- rotational direction arrow
- identifications for fluid connections

must be observed at all events and maintained in a fully legible condition.

- Note: There is an increased skid risk in case of spilled/leaked out lubricants. They are to be removed at once properly.

Safety sign according to DIN 4844-2, W28, warning about skid risk.

2. Safety (continuation)

2.2 Personnel qualification and training

The operating, maintaining, inspecting and erecting personnel must have the appropriate qualification for such work. Area of responsibility, competence and supervision of the personnel have to be regulated by the user. If the personnel do not have the necessary knowledge, they have to be trained and given instructions. This can be effected, if necessary, by the manufacturer/supplier on behalf of the user of the machine. Furthermore, the user has to make sure that the contents of the operating instructions are fully understood by the personnel.

2.3 Dangers in case of nonobservance of the safety instructions

The nonobservance of the safety instructions may result in hazards to persons, to the environment and to the machine. The nonobservance of the safety instructions may lead to the loss of any claims for damages. In detail, the nonobservance may for instance lead to the following hazards:

- Failure of important functions of the machine/system
- Failure of prescribed methods for maintenance and repair
- Hazard to persons by electrical, mechanical and chemical influences
- Hazard to the environment by the leakage of dangerous substances

2.4 Safety conscious working

The safety instructions stated in these operating instructions, the existing national regulations as to the accident preventation as well as possible internal working, operating and safety rules of the user are to be observed.

2.5 Safety instructions for the user/operator

- If hot or cold machine parts lead to dangers, these parts have to be protected against touch.
- Protection against touch for moving parts (e. g. coupling) must not be removed when the machine is in operation.
- Leakages (e. g. from the shaft seal) of hazardous goods to be delivered (e. g. explosive, toxic, hot) are to be removed in such a way that there is no danger to persons and environment. Legal rules are to be observed.
- Hazards caused by electrical power are to be excluded (for details please refer for instance to the rules of the VDE and the local power supply companies).

2.6 Safety instructions for maintenance, inspection and installation work

The user has to take care that all the maintenance, inspection and installation work is executed by authorized and qualified skilled personnel who have informed themselves adequately by thoroughly studying the operating instructions.

Basically, work on the machine is only to be carried out during shut-down. It is obligatory to observe the shut-down procedure described in the operating instructions.

Pumps or pump aggregates that deliver media being hazardous to health have to be decontaminated. Immediately after completion of the work, all safety and protective equipments have to be reinstalled and/or reactivated.

- Advice: When working with compressed air, do wear glasses.

(DIN 4844-G1 – Use breathing mask)

- Advice: Observe EC-Safety Data Sheet for materials of consumption and additives used and use personal protective equipment.

(DIN 4844-G4 – Use breathing mask)

Before recommissioning, observe the points stated in section “initial start-up“.

2. Safety (continuation)

2.7 Unauthorized conversion and manufacture of spare parts

Conversion or modifications to the machine are only permitted when agreed with the manufacturer. Original spare parts and accessories authorized by the manufacturer serve to ensure safety. The use of other parts may render the liability for consequential losses null and void.

2.8 Unacceptable modes of operation

The operational reliability of the machine supplied is only guaranteed if the machine is used in accordance with its intended purposes as per section 1 - General - of the operating instructions. The limiting values specified in the data sheet must on no account be exceeded.

2.9 Guidelines & standards

Guidelines

1. Machines 98/37/EG
2. Low voltage 73/23/EWG
3. EMV 89/336/EWG

Standards

EN Reference	ISO Reference	acc. to guideline
• DIN EN 982, 9.96	(ISO 4413, 8.98	(1.)
• DIN EN 983, 9.96	(ISO 4414, 8.98)	(1.)
• DIN EN 1050, 1.97	(ISO 14121, 2.99)	(1.)
• DIN EN ISO 1200-1 and –2, 4.04		(1.)
• DIN EN 60204-1, 11.98	(IEC 60204-1, 5.00)	(2.)
• DIN EN 60947-5-1, 2.05	(IEC I 60947-5-1, 11.03)	(2.)
• DIN EN 61000-6-2, 8.02	(IEC 61000-6-2, 1.05)	(3.)
• DIN EN 61000-6-3, 8.02	(IEC 61000-6-3, 1.05)	(3.)
• DIN EN 61000-6-4, 8.02	(IEC 61000-6-4, 1.05)	(3.)

GENERAL PRODUCT CHARACTERISTICS

- for migratory lubrication points
- max. working pressure up to 160 bar
- Lubricant up to NLGI class 1, DIN 51813

A. LUBRICATING HEAD TYPE RKC

B. KIND OF LUBRICATING HEAD

Lubricating head RKC without plate for lowering lubricating nipple
Lubricating head RKC with plate for lowering lubricating nipple

C. INSPECTION

Stage A

D. ACCESSORIES

without

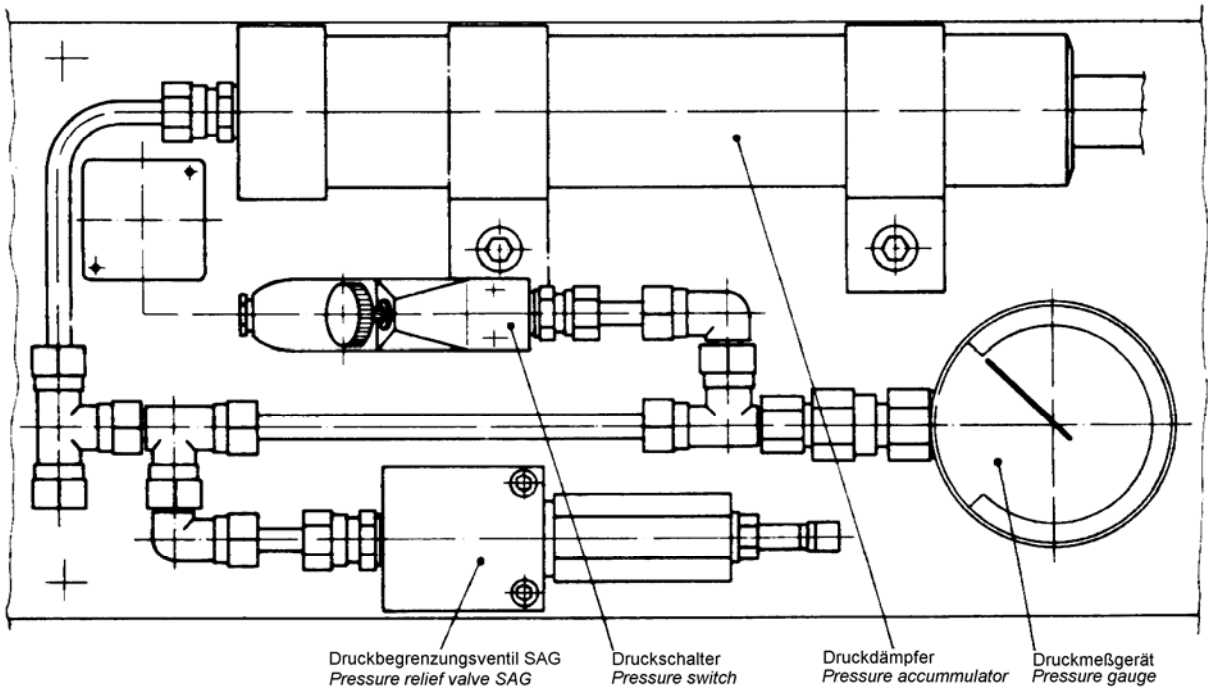
3. Application

RKC centralised lubrication systems are generally used to server moving parts such as links, guide rollers, chain pins, castors, hinged joint, etc. whilst the conveyors, plate bands ar ancillary mechanisms are in motion.

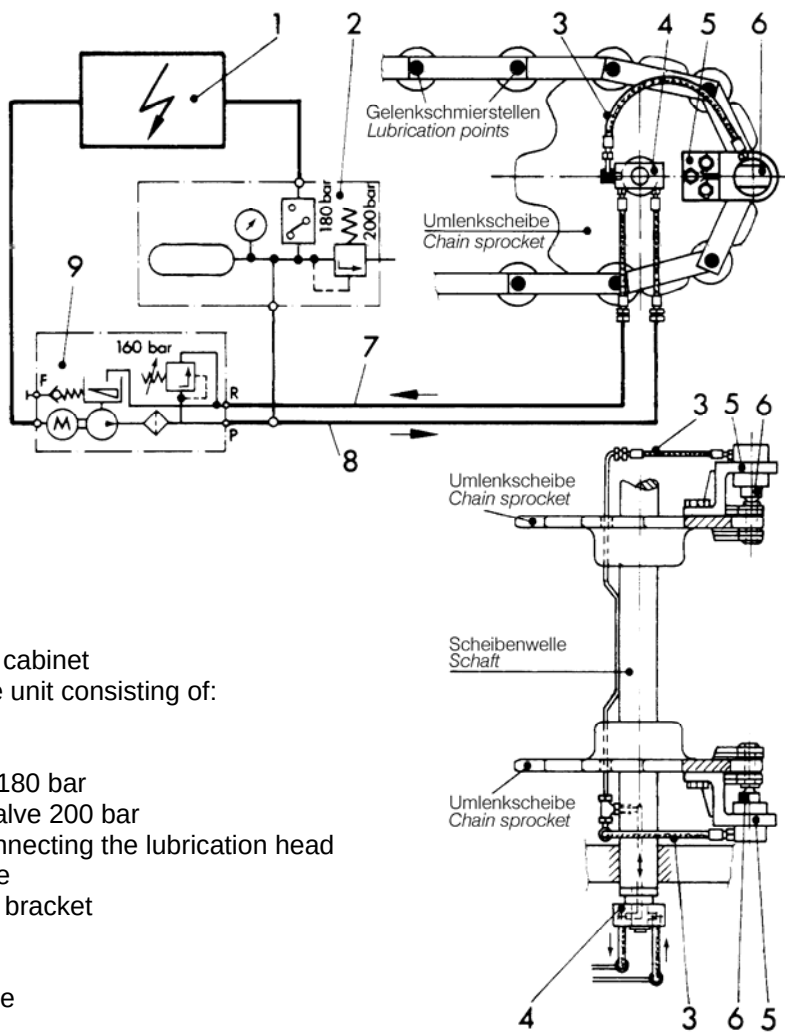
4. Specification

Working pressure max.: ..... 160 bar
Lubricants grease up to ..... NLGI class 1, DIN 51813*
Ambient temperature: ..... - 20º up to 80ºC
Pump BSB
Output volume ..... 7, 14 or 22 l/h
Pressure relief valve preset to ..... max. 160 bar
Pressure storage unit
Prefilling medium nitrogen ..... 70 up to 100 bar
Storage capacity, lubricant max. ..... 400 cm^3
Pressure relief valve ..... set to 200 bar
Pressure switch ..... set to 180 bar
Rotary slide valve
Opening angle to pressurise 60º
Opening angle to depressurise 260º
Lubrication head
Output volume ..... 0.2; 0.3; 0.4 preferably 0.5 cm^3
Control volume each greasing cycle ..... max. 4 cm^3/per lubrication head

* If lubricants to NLGI class 2 are to be utilised, please consult us beforehand.



5. Function



1. Electrical control cabinet
2. Pressure storage unit consisting of:
   Accumulator
   Pressure gauge
   Pressure switch 180 bar
   Pressure relief valve 200 bar
3. Flexible hose connecting the lubrication head
4. Rotary slide valve
5. Lubrication head bracket
6. Lubrication head
7. Return line
8. Pressure feed line
9. Pump BSB

The RK-C lubrication system is designed to deliver a metered shot of grease to the chain pins once the chain in positively engaged with the sprocket.
The lubrication heads (6) are mounted on brackets (5) which are secured to the sprocket in line radially and axially with chain pins once the chain is engaged. The number of lubrication heads to ensure that all points are lubricated is dependent on the number of chain pins and the number of teeth on the sprocket and can be calculated as shown on page 4. The system is controlled by the 3 way rotary slide valve (4) which is secured to the end face of the shaft on which the sprockets are mounted. This valve connects the pressure and the relief line in turn to the lubrication heads as the shaft rotates relative to the body of the valve.
When the lubrication heads (6) are connected to the pressure line the injection piston is first pushed tightly against the greasing nipple of the chain and then the lubricant is discharged via the feed piston. The ammount of lubricant delivery may be varied by exchanging the metering screws which control the stroke of the feed piston.
When the heads are connected to the relief line the spring loaded piston retracts the injector to its initial position prior to the chain leaving the sprocket. This also recharges the feed piston with a fresh quantity of lubricant ready for the next cycle.
The BSB grease pump (9) is continually pumping grease although the lubrication heads are only engaged with the chain for a partial cycle of the sprocket. During the relief period the grease is stored under pressure in the accumulator ready for the next lubrication cycle.

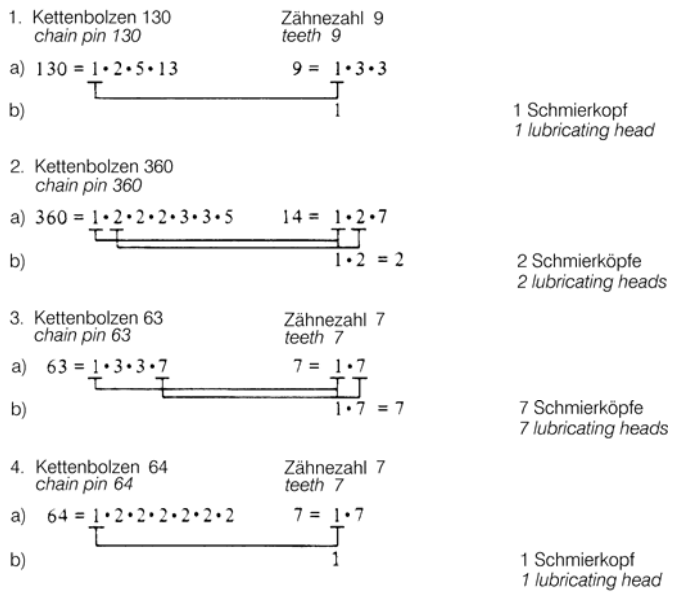
6. Installation and Commissioning

The lubrication heads should be mounted on the sprocket in line radially and axially with the grease nipples when the chain is positively engaged. The mounting brackets do allows, however, for minor adjustments enabling the injector to be aligned accurately with the grease nipples.
Axial adjustemnt ± 10 mm, Radial adjustment ± 4 mm
All locating faces for the mounting brackets and the rotary slide valve must be maniched flat to ensure correct alignment.
The grease nipples used should always be hardened.
The maximum clearance required for the lubrication head between the conveyor framework and the face of the grease nipple is 120 mm, also provision for connection of the lubrication heads should be provided.
As the chain pins are lubricated while the chain passes around the sprocket, the greasing channels of the bolts and bushes must be positioned so as to allow the lubricant to flow unimpededly directly to the lubrication points. However, if the greasing channels could become misaligned, annular groves should be provided around the bolts and bushes in order to make sure the lubricant can reach the desired points, irrespective of the position of the chain.
After installation the system should be primed with grease and the pressure accumulator should be charged with the nitrogen to a pressure of between 70 and 100 bar.
The rotary slide valve should then be adjusted so that the notched marks on the centre spindle and the body are in line with the lubrication head(s) at the start of the greasing cycle. The lubrication head(s) should then be aligned with the grease nipples and the system switched on. The heads should be finally alogned and then doweled into position.

7. System calculation

The number of teeth on the sprocket determines the sequence of lubrication per cycle, e.g. on a 7 tooth sprocket every 7th chain pin will be lubricated. However, to ensure that the chain indexes around the sprocket, after each full circuit of the chain, the ration of the number of links on the chain and the number of teeth on the sprocket has to be calculated. This, together with the angle the vhain is engaged with the sprocket determines the arraqngement of the lubrication head(s) on the sprocket.
In order to determine the number of lubricating heads required from the number of links in the chain and the teeth on the sprocket, proceed as follows:

a) Divide the number of chain pins into the product of their prime numbers starting with the number 1. This is done by dividing each prime number in turn into the number of pins until the result becomes a fraction in which case the next prime number should be tried and so on.
b) Then divide of the number of teeth on the sprocket into the product of their prime number as above.The number of lubrication heads necessary results from the product of all the prime factors common both to the number of pins and the number of teeth.



Examples:
As regards example 3, seven lubrication heads theoretically are required to lubricate each tooth, which is not feasible due to insufficient space and to the working conditions of the unit.

However, by modifiyning the sprocket or by altering the number of links by one tooth or one link, the number of lubrication heads required can be reduced.

As regards to example 4, the chain had been modified by adding one link thus increasing the number of chain pins to 64, as result of which now only one lubrication head is necessary to do the job as against 7 in example 3.

8. Plates

Name plate 110 x 60 mm (75511-1531)

Type plate 110 x 60 mm (75511-1321)

DELIMON®

Manufacturer's declaration

This manufacturer's declaration as to the fulfilment of the requirements according to the

- **EC machine guideline 98/37/EG**

is only valid in connection with the installation/operating instructions and the relating data sheet, both being valid for the product.

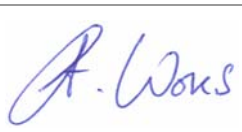
We,

Company	Address	Telephone
DELIMON GmbH	Arminstraße 15 40227 Düsseldorf	+49 211 77 74 0

hereby declare on our sole responsibility that all products supplied by us and being relevant to guidelines and which this declaration refers to, conform to the mentioned standards and that they, if necessary, were released by a competent authority.

Applied, harmonized standards:
See valid installation/operating instructions with relating data sheet

We declare that this consignment comprises an incomplete machine and that the commissioning of the same remains prohibited until it has been determined that the machine into which the machine in question shall be installed, complies with the above mentioned regulations.

January 12, 2005		
Datum	**Jörg Czempisz** Geschäftsführer	**Andreas Wons** Direktor Entwicklung & Konstruktion

BIJUR

FARVAL

LUBESITE

DELIMON-DENCO
LUBRICATION

DELIMON GmbH
Arminstraße 15
D-40227 Düsseldorf
Telefon: +49 211 7774 0
Telefax: +49 211 7774 210

Niederlassung
Am Bockwald 4
D-08344 Grünhain-Beierfeld
info@delimon.de
www.delimon.de

Amtsgericht Düsseldorf
HRB 40813
Geschäftsführer
Dipl.-Ing. Jörg Czempisz
Thomas W. Arndt

Commerzbank AG, Düsseldorf
Konto 3 223 765
BLZ 300 400 00
Ust.-IdNr.:DE 813 228 741
Steuer-Nr.:133/5814/0866